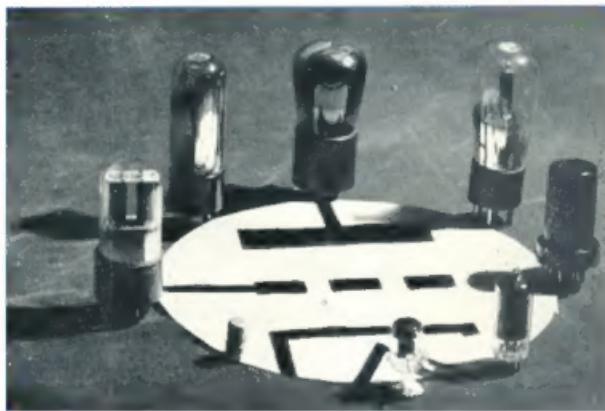


AMATEUR RADIO

JUNE 1965



Vol. 33, No. 6



2/6

RECORDING TAPES

WELL-KNOWN MAKES BRAND NEW IN CANNED FORM

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| 159 ft. on 3 in. reel (Acetate Base) | 6/- |
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All above cables are in as new condition.

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Price: £9.10/- inc tax

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AMERICAN TYPE

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C93 Coaxial D.ble. ended female Cable

Joiner (PTFE) 17/6

UG175U Adaptor for PLT59 to suit 1/4 in. Cable 2/9

C32-17 Coaxial "D" Piece suit PL259 22/3

BNC Series:

UG68 C/6 Coaxial Plug (PTFE) 15/9

UG69/U Coaxial Socket (PTFE) 12/6

Belling Lee type:

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Coaxial Socket (flush mount) 3/6

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| | |
|---|------|
| 290v-0-290 volt 60mA 6.3v 2A, 5v 2A, 8v 2A | 27/- |
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CENTRAL CT230 Multimeter 30,000 ohm opv.

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Multimeter Probes 200H Movement 8/-

Meter Rectifiers 10/-

Multimeter Probes 200H Movement 8/-

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"AMATEUR RADIO"

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA. FOUNDED 1910.

JUNE 1965
Vol. 33, No. 6

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6005
Mrs. BELLAIRS, Phone 41-3335, 478 Victoria Parade, East Melbourne, C.E. Victoria. Hours 10 a.m. to 1 p.m. only.

Publishers:
VICTORIAN DIVISION W.I.A.
Reg. Office: 65a Franklin St., Melbourne, Vic.

Printers:
"RICHMOND CHRONICLE" Phone 43-3419.
Shakespeare St., Richmond, E.I., Vic.

★

All matters pertaining to "A.R." other than subscriptions, should be addressed to:

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P.O. BOX 36,
EAST MELBOURNE, C.E. VIC.

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Members of the W.I.A. should refer all enquiries regarding delivery of "A.R." direct to their Divisional Secretary and not to "A.R." direct. Non-members of the W.I.A. should write to the Victorian Division, C/o P.O. Box 36, East Melbourne. A change of mailing address is required before a change of mailing address can be effected. Readers should note that any change in the address of their transmitting station must be P.M.G. registered, and should be P.M.G. and State of residence. In addition "A.R." should also be notified. A convenient form is provided in the "Call Book".

★

Direct subscription rate is 2/- a year, post paid, in advance. Issued monthly on the first of the month, January edition excepted.

★

OUR COVER

Around the symbolic figure for a triode has been arranged a series of triode valves covering the period from 1930 until 1965. Reading clockwise from the cathode symbol, the valves are: 6CW4, 6SN7GT/G, 30, A415, 27, 6C5, 6C4, and a 954. How many readers can remember when each valve was first marketed and used in Amateur equipment?

FEDERAL COMMENT

★

W.I.A. ADMINISTRATION

The Wireless Institute of Australia is well known as the organisation within the Commonwealth which represents the Amateur Radio Service but it is also true to say that many amateurs are ignorant both as to how it functions and what it does for the Amateur. Although over 5,000 strong, the membership is spread over a comparatively vast area requiring administration from a central organisation which at the same time must encompass liaison with local and State administration. This is achieved by the Federal Council composed of a member elected in each Division of the Institute whose special function is to act as the representative of his Division on behalf of its Council and members, the requirements being carried out by the Federal Council's ex-officio office—the Federal Executive. The Federal Executive, therefore, becomes the central organisation empowered under a Federal Constitution to carry out the work of the Federal Council on behalf of the Divisional Councils which in turn act on behalf of their members.

If you, as a member, have a complaint which affects Amateur radio in general and not a complaint of a purely domestic nature, then you need to know who holds the office of Federal Councillor in your State or Division. For the period 1965-66 the following are the people you should contact:

| | | |
|-----------------------|--------------------|--------|
| VK2 Division (N.S.W.) | Pierces J. Husby | VK3APB |
| VK3 Division (Vic.) | Michael J. Owen | VK3ZEO |
| VK4 Division (Qld.) | Laurie Blasborough | VK4ZGL |
| VK5 Division (S.A.) | Geoffrey M. Taylor | VK5ZCQ |
| VK6 Division (W.A.) | Roy Chamberlain | VK6RY |
| VK7 Division (Tas.) | Ted J. Cruise | VK7EJ |

Knowing your Federal Councillor, you can then make contact with him direct (or through any member of your Division's Council) and place your problem before him. From his experience he will know whether the problem is one which can be attended by your local Council or whether it should be referred to the Federal Executive.

If your problem is one requiring Federal Executive action then your Federal Councillor will see that it is directed to the Executive in a manner prescribed for him under the Federal Constitution and you can expect to hear the result of this action in due course. The Executive for 1965-66 is composed of the following members:

| | | |
|--------------------------|------------------------|--------|
| Federal President | G. Maxwell Hull | VK3ZB |
| Federal Vice-President | James H. Burn | VK3AFQ |
| Federal Secretary | Peter D. Williams | VK3ZD |
| Federal Treasurer | Kevin Connolly | VK3ARD |
| Federal Communications | William T. S. Mitchell | VK3JUM |
| Federal Business Manager | Alfred Seedsman | VK3HE |
| Federal Contest Manager | David Rankin | VK3QV |

For your information the Federal Executive has the power to co-opt people to carry out specific tasks and the following are so co-opted for 1965-1966 to do just this:

| | | |
|-----------------------------------|----------------|--------|
| Federal QSL Manager | Ray E. Jones | VK3RJ |
| Federal Awards Manager | Alfred Kissick | VK3KBD |
| Federal Historian | George Glover | VK3JAG |
| Federal Contest Committee Manager | Jim Rumble | VK3RU |

If you know who runs your Institute you can talk to them on the air because they are all active Amateurs, dedicated to their tasks on your behalf and on behalf of the Amateur Radio Service in the Commonwealth of Australia and its Mandated Territories. They want to help you and your hobby and look forward to your co-operation during the next 12 months to make their term of office a fruitful one for the Institute and the Amateur Service in general.

—G. MAXWELL HULL. Federal President.

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AN EFFECTIVE LOW-COST TRANSMITTER

HAROLD L. HEPBURN,* VK3AFQ

THE transmitter described in this article is the outcome of some experiments on efficiency modulation carried out by the writer during a search for a modulation system for a low cost, low drain, rig that might have application in the portable sphere.

Results over the 18-month period it has been on the air have been most satisfactory and it was felt that a brief description of the rig might be of interest to other readers of this magazine.

Whilst the unit described operates only on 160 and 80 metres, there is no reason why the frequency range could not be extended by using, say, the Geloso v.f.o. in the exciter section.

The more widely used methods of "efficiency" modulation where the modulating voltage is applied to electrodes other than the plate, normally call for a resting carrier which is about half of the full c.w. carrier level. Valve efficiency is low and in most cases the depth of modulation leaves much to be desired.

A screen modulation circuit described in the R.S.G.B. Handbook and known as the "gated screen" method appeared to be an improvement since the resting carrier is only one-fifth to one-eighth of the full c.w. level and claims were made that full modulation is obtained at all carrier levels. In addition, it is claimed that no over modulation could occur.

Allowing that their claims are correct—and experience with this transmitter has indicated that they are—then it appeared that considerable economies could be effected in the section of the transmitter which is normally the most expensive—the power supply.

DESIGN CONSIDERATIONS

Taking as an example the old familiar 807 and looking at its plate power requirements under several conditions, some interesting facts emerged.

* 4 Elizabeth St., East Brighton, Vic.

Let us suppose we have 600 volts of h.t. available, then if we decide to operate the 807 as a plate and screen modulated class C amplifier, a la handbook, we have to allow for a steady current drain in the p.a. of 100 mA. or 60 watts. If we decide phone is not required and we will be working c.w. only, we can reduce this requirement on the power supply by assuming that the transmitter has a 40% duty cycle—that is the "dit" and "dahs" only occupy 40% of the transmitter "on" time. This really does mean that we could use a 600V. 40 mA. power transformer to supply the p.a. plate provided we make the filter condensers large enough to cope with the peak current requirement.

If we go further and assume we are going to use the 807 for speech only and that we are going to use normal screen modulation, then we have to provide a steady current of 50 mA. (half the c.w. maximum) and a bit more for the periods when we are actually modulating. If we assume that the speech duty cycle is 20% (a bit high, but a nice round figure), then this is equivalent to saying that we have to provide for 50 mA. steady drain plus the equivalent of another 10 mA. to cope with the speech variation. Provided once again we provide good dynamic voltage regulation by making the filter condensers large enough we can get away with a 60 mA. rating on the transformer.

Using "gated screen" we can do even better. Since the resting plate current is only one-fifth of the full current then we have only to supply 20 mA. average steady current plus the equivalent of another 20 mA. to deal with the speech power. Total is only 40 mA. or two-thirds of other efficiency methods. Note that this average current requirement is the same as the c.w. example, so that we can use either mode.

If we want to squeeze some more efficiency out of the p.a. tube we can

run at higher voltages. The 807 is rated at a plate voltage of 600 under plate and screen modulation conditions. This means it has to withstand a peak voltage of 1,200. Provided you keep the average plate dissipation within specifications, you can, in fact, run an 807 with 1,200 volts on the plate and still not over run the tube. Both R.S.G.B. and A.R.R.L. Handbooks publish design data for 807 and 1625 linear s.a.b. amplifiers at these voltage levels.

Bearing in mind the foregoing, it was felt that normal broadcast transformers might well be able to provide the power for a 70-watt c.w./peak am. rig. The schematic of the completed transmitter is given in Figs. 1 and 2. Change-over switching is shown in Fig. 3, and meter switching in Fig. 4.

THE TRANSMITTER

The r.f. section of the transmitter consists of a 12AT7 v.f.o., a 6AM6 un tuned buffer amplifier, a 6V6 buffer/doubler/driver, and an 807 final.

The 12AT7 oscillator is in a Franklin configuration since it enables the use of a two-terminal tank with one end earthed and because its output is constant over its tuning range of 1.75-1.90 Mc. The more popular Clapp circuit suffers from the disadvantage of giving less output at the h.f. end of its range. The lower, but more constant, output of the Franklin is overcome by the use of a 6AM6 buffer amplifier.

The 6V6 buffer/doubler provides ample drive on both bands; this drive being adjusted by the potentiometer in the screen circuit.

The 807 final uses a pi-tank output and the additional capacities required on 160 metres are brought into operation by a separate section of the band switch S3.

For netting purposes, h.t. is applied to the whole transmitter, but the p.a. is prevented from radiating by applying 105 volts negative to the screen. Since the negative supply is required

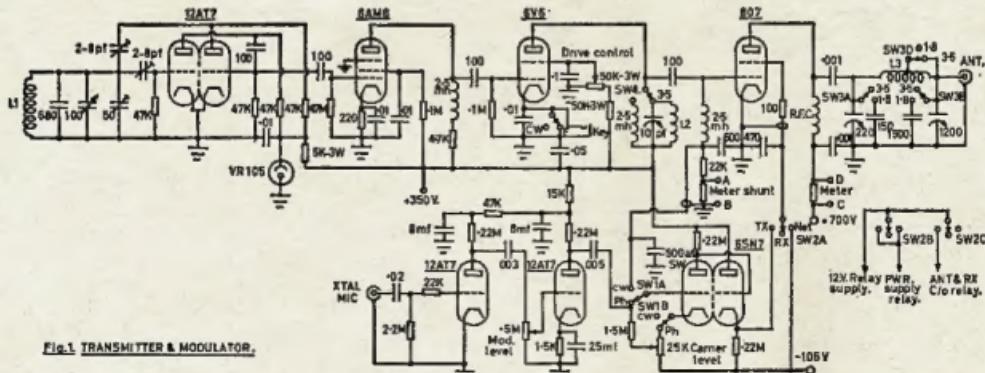


Fig. 1 TRANSMITTER & MODULATOR.

YAESU MUSEN FL-100B S.S.B. TRANSMITTER

A Compact High Quality Mechanical Filter Rig

COMPLETELY SELF CONTAINED

NEW MODEL

FEATURES

Satin finish panel with black engraving, large instrument-type knobs, variable ant. loading, built-in ant. relay, V.O.X. keying for bk-in c.w. Mechanical filter—still acknowledged as the best method of S.S.B. generation.

Five bands, 80-10 m., illuminated v.f.o. dial, reads 10 Kc. and 1 Kc., with precision vernier gear drive, P.T.T. control via net-operate switch or push-button mic. A.L.C., V.O.X., selectable sidebands, 230v. and 110v. a.c. operation. 120W. P.E.P. to 6DQ5 p.a. All in one neat metal case, 15" x 7" x 11 $\frac{1}{2}$ " deep, colour dark driftwood. Wt. 35 lb. Nothing else to buy. All necessary plugs, inst. manual, and matching p.b. mic. are included. Introductory trade-in offer this shipment.

Write for Brochure to Australian Agents:



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FOSTER DYNAMIC MICROPHONES FOR HAND-DESK USE

SPECIFICATIONS:

Output Impedance 50 ohms or 50K ohms
Effective output level -55 db. [0 db. = (one) 1V. Microbar]
Frequency response 200 to 10,000 c.p.s.

OMNI-DIRECTIONAL DYNAMIC:

SIZE: 3" x 2-1/8" x 1".
Cable: 12 ft. of P.V.C.
Switch: on-off.
Desk Stand. Clip folds for hand use.
Colour: WHITE.
Plastic Diaphragm.

Retail Price
50K ohms
£2/10/7
+ Sales Tax 5/3



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WHY A BLACK BORDER ALL AROUND THIS PAGE OF "A.R."

Last month the Publication Committee reported that certain changes had to be made in the manner in which all notes for "A.R." were presented and by actually showing a full-scale layout it should assist all correspondents.

Our Printer has advised certain changes at his works, the result of which is that all correspondents must present their notes in a standard form. This means using quarto size paper, allowing a one-inch margin at the top, both sides and the bottom. Each page must be numbered and if typewritten use double spacing please. If your notes are handwritten please leave a space equal to the depth of your handwriting between each line. If this is not done it is most difficult to edit your notes, and if they cannot be edited they may have to be omitted, something neither you nor your Committee wish to have happen. You may well ask why the need for such a wide margin, particularly at the top and bottom. The reason is quite logical: if this margin is omitted then your notes cannot be properly read when they are being set for the magazine, in fact, certain items at the margin edges (if not used) are obliterated by the typesetting machine. So please use a margin on all edges of your paper.

If you desire to have a hamad or a special item inserted in "A.R." please put it on a separate piece of quarto paper so that this piece of paper can be passed on to our printer. If your special item is included in the body of a letter it does make it difficult to pass this on to the printer.

Please help your Committee by (1) using quarto size paper only for all correspondence; (2) allow one inch wide margin around all sides of the paper; (3) if typewritten use double spacing; (4) or if handwritten allow adequate space between each line.

The rest of this space is used to feature the Publications Committee Reports (by so doing you can see exactly how a perfect copy for "A.R." should look. Compare it with your notes and see how much easier this layout is to read).

All inwards correspondence received up to the last mail on 10/5/65 has been published in this issue of "A.R." Technical articles were received from VK's: 2ADE, 3TD, P. Ward and ZL2APC. Letters were from: 9M2DQ and VK5BB.

The Committee were very sorry to learn that 5BB has to resign as DX sub-editor due to ill-health. We gratefully acknowledge his past help and wish him a speedy recovery. The question of the front cover design was actively discussed and it was agreed to proceed with idea of a new layout. The report regarding the Federal Convention was discussed and matters affecting "A.R." noted.

Advertising charges were considered and it was agreed that the current charges would be increased. It was furthermore agreed to issue a special edition of "A.R." in order that potential advertisers could be acquainted with the magazine.

Future operating costs were considered and it was agreed that as finances now permitted, your Committee would commence using a better quality paper for "A.R.", all readers will welcome this change.

The next "Call Book" is scheduled for issue the first week in September, and as far as practicable this date will be held for all future editions of this publication. Further advice will appear in future issues of "A.R." The Committee were pleased to note the increased co-ordination with Federal Executive who have issued their report. In addition a full report has been received from the Youth Radio Scheme.

You may judge your space needs by realising that this page, as set, would normally occupy one page of "A.R."

- P.S.—Please never address publications matters direct to individual members of the Publications Committee as they may be away, hence your notes, etc., are then delayed even further.

THE ARC-PORT*

A Portable 80-Mx Transmitter-Receiver using the ARC-5 Receiver

E. H. MARRINER, W6BLZ

FEELING dull, tired and wheezy after hours of yakking on that smoking sideband ring? Why not a change and so some building before you forget what the parts symbols mean. Get ready for your vacation or a field day. Here is a compact 18 watt c.w. transmitter on the back of an 80 meter ARC-5 receiver, which is a lot of fun to build. The receiver is modified a bit by replacing the old mica capacitors, bandspread the v.w. band and putting in a crystal controlled b.f.o. These modifications give you all kinds of room under the chassis to vent your imagination on compacting a rig into one package, including the power supply.

ABOUT THE RIG

Mounting the transformer on the back apron of the ARC-5 just left room for three tube sockets. Searching around for tubes in the transmitter, this combination seemed to be the only logical choice: The pentode section of a 6U8 was used for the v.f.o. driving an Amperex 6360 final amplifier. This tube is not a baby, it will handle 180mA. plate current, fully loaded. It is a rugged tube and you don't have to worry about the plates getting red. The other socket was used for a voltage regulator.

Being pushed for room, the v.f.o. coil and tuning capacitor was mounted up in the front compartment away from the heat. It just fits, and with the bottom cover plate on the chassis, enough room is left around the coil. This Hartley oscillator is solid both mechanically and in frequency stability. The stability is increased by leaving the grid circuit on 1.7 Mc. and doubling in the plate circuit to 3.5 Mc. Small coaxial RG-174/U is used to connect the coil to the v.f.o. tube.

- Using an 80 metre ARC-5 as a base, the author has added a small transmitter with 18 watts input. The receiver is modified and is bandspread to cover only the C.W. portion of the band. Included is a special time delay keying circuit and an antenna tuner to help match those nondescript vacation antennas.



Side view of the rear section shows the three added tubes that comprise the transmitter. The power transformer is visible in the rear. The output coil, L3, and the link winding, L4, can be seen above the tubes and the compression trimmer is just visible behind the coil.

The voltage for the transmitter and receiver is switched with a relay to reduce the drain on the transformer. Using the triode half of the 6U8 as a keyer tube, voltage is supplied to the v.f.o. tube all of the time the 6360 cathode is being keyed. When you let go of the key, the voltages automatically switch to the receive position and the release time can be set for any interval of hold-in. In other words, to send, all you have to do is press the key. There are no switches to turn; the oscillator is on while you are keying, but goes off automatically when you stop.

The final amplifier, the 6360, is tuned using a combination compression type capacitor and varying the slug on the XR-50 coil, to cover the whole 3.5 Mc. to 3.7 Mc. band. The compression type capacitor can be obtained with a shaft and knob and is the only tuning capacitor that will fit in the tight space at the back of the chassis. Everything seems to really fit snugly and in an orderly fashion on the chassis.

The receiver portion is essentially the same old ARC-5 except that it has been bandspread to cover the 3.5-3.7 range and a crystal b.f.o. has been added. All of the old mica capacitors were taken out and replaced with 0.02 m.f. micas. The process of removing

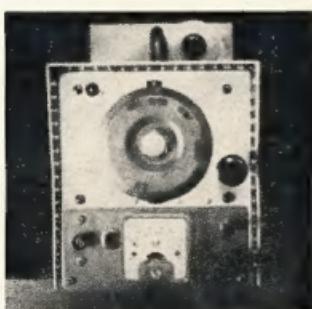
all of these parts, especially the old b.f.o. can, leaves an amazing amount of space underneath the chassis for new parts.

RECEIVER CONSTRUCTION

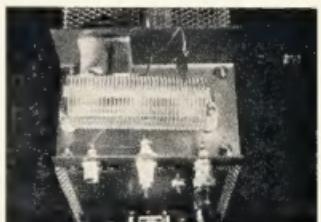
Before starting, haywire a power supply together on the bench and check out the receiver to make sure that it is working. When you make changes modifying the wiring, check it from time to time to see if it still works. Without going into too much detail, the first things to change are the large mica capacitors. The wires can be traced back to their source, clipped and a 0.02 m.f. ceramic soldered in its place. The output transformer can be changed and the new one mounted on the side of the chassis and at the same time make sure to put a 0.005 ceramic capacitor from the plate of the 6V6 (or 12A6) audio output to ground to replace the one removed. This prevents transients from breaking down the transformer insulation and also prevents audio oscillation.

Now after all of this modification and the receiver still says "A OK," you can try to bandspread the receiver. Leaving three rotor plates in the tuning capacitor will spread the band from 3.5 to 4.0 Mc. If you are strictly a c.w. nut, just one plate on the rotor is all that is needed. This is not too hard to do but just don't lose the 80 metre band in the process. A signal generator will help but is not absolutely necessary; a 3.5 Kc. crystal marker is just about needed. One plate will spread the band from 3.5 Mc. to 3.7 Mc. and a slight change in capacity will shift the dial. The final check should be made with the cover over the tuning capacitor.

Here's how to go about the change. First remove the slotted plate on each of the sections. Next unsolder the brace on top holding all of the rotors together. To get the plates out here is the magic formula. Wiggle each plate back and forth 50 times with long nose pliers and then give a downward push and it will roll right out. Keep your left hand on the shaft to prevent it



Front view of the Arc-Port 80 metre transmitter-receiver. The knob to the lower right of the meter is the v.f.o. frequency. Above this is the volume control. The p.h. to the left of the meter is the cal. switch.



Rear view of the Arc-Port shows the antenna tuner mounted on top. Note the keyer circuit battery on the bottom of the rear apron.

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from moving or the ball bearings will come out and it is fun to get them back in place. Now put a 82 m.m.f. silver mica capacitor across the oscillator and mixer coils. Across the antenna coil section put a 62 m.m.f. silver mica. This one has to be a little less because it has the small variable plus any capacity of the antenna.

Somewhere along the line the b.f.o. transformer can be removed and a crystal b.f.o. wired in. See Fig. 1.

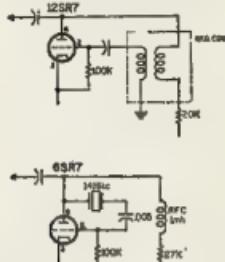


Fig. 1 Original ARC-5 b.f.o. circuit and the modified crystal controlled version. The r.f.e. is a Miller gauge 4602 and the crystal is an International FA-9 pigtail type cut to 1418 Kc.

POWER SUPPLY

After you are satisfied with the performance of the receiver based on its operation with a temporary supply, we can proceed with the rear deck work. A plate, shown in Fig. 2, can be made to cover the rear deck after the deck has been nibbled out to within $\frac{1}{2}$ in. of the chassis edge.

The supply voltage to the receiver section was reduced to 250 volts through a 5.5 k., 10 watt resistor. This is shown in Fig. 3. The screen voltage is reduced to 100 volts through a 25 k. series resistor. Since the 6380 triode section (receiver local oscillator) was hooked up to the regulator tube for a steady voltage, the variation on the screens due to plate current drain at various gain settings was not stabilized with a bleeder arrangement.

A small loudspeaker of the type used in transistor radios was mounted over the 6SK7 tube. Its rating of 0.25 watts doesn't seem to be a problem. It is

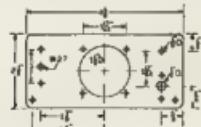


Fig. 2 Dimensions of the front and back plates for the ARC-Port.

loud and sharp for c.w. with its limited frequency response. An output transformer, 5 k. to 4 ohms, is mounted below chassis as shown in the photographs.

TRANSMITTER SECTION

First wind the v.f.o. coil, tapping it six turns up from the bottom end. I scraped the wire and twisted it together and then brought the pigtail over to a terminal which was made by tapping a 4-40 screw into the base of the form. Coaxial cable (RG-174) was used to connect the coil to the tube socket. A 410-20 m.m.f. silver mica capacitor was used as a paddler across the 100 m.m.f. variable tuning capacitor. With this combination the tuned circuit should hit 1.7 Mc. with the bottom cover in place. The coil can be mounted an equal distance between the chassis and the cover.

It is probably easier to wire the v.f.o. and 6380 amplifier tube before tackling the keying circuit and it leaves more room to work under the chassis. The plate circuit of the 6380 is mounted topside, and a compression type capacitor is used for plate tuning. This capacitor can be obtained with a shaft if desired, or if you have to use the screw slot type a washer can be glued on for a knob. Using the combination of the compression type capacitor and the slug adjustment, the range will cover 3.5 Mc. to 3.7 Mc., doubling in the plate circuit.

I find the keying circuit handy although many may want to use either a small toggle switch or a relay to change the voltages from transmit to receive. Using the keyer circuit, the relay is energised in the receive position to make a more foolproof circuit.

The advantage of the keying circuit is there is no switch to flip when you transmit. Just press the key and send, when you let go, the receiver comes back on after a delay determined by the setting of the 1 m.eg. delay control which is mounted at the back of the chassis. It is a subminiature type potentiometer. The small 15 volt battery mounts on the back of the rig in modified fuse clips for easy replacement. The drain is very light and should last the shelf life of the battery; ours has been in for months.

There is no trouble with the keying circuit once it is built. The value of the series plate resistor was set at 18K as this permitted enough current to flow to close the 10K d.c. relay. Relay coils other than 10K might need a different value series resistor. Also the keying 1N539 diode was used because of its high back resistance and low leakage to prevent the charge from draining away on the 0.2 m.f. holding capacitor. There may be other diodes that will work just as well but of the several tried, this one seemed to do the job best. A Mylar 0.2 m.f. should be used here as it has low leakage and worked out right. Others might have more leakage. I set my delay to hold the v.f.o. in be-tween words.

TESTING

Most of the adjustments probably were made by the constructor as he went along but here is how I did it. When the v.f.o. and 6380 were wired up and finished I temporarily put on the bottom cover and set the dial to 3.5 Mc. The slug was tuned for zero adjustment on the v.f.o. coil and then shifted to about 3550 Kc. where the

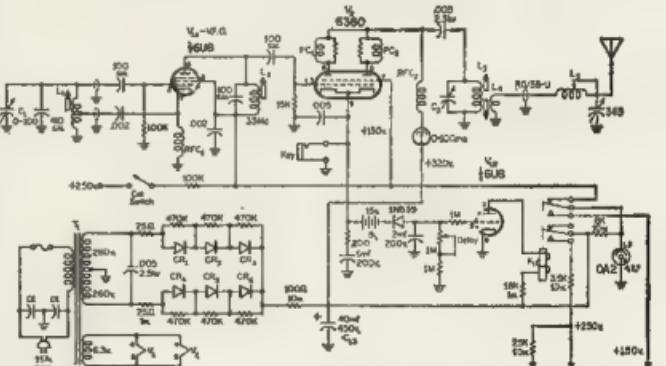


Fig. 3 Circuit of the transmitter, power supply and keyer that, when added to the ARC-5 receiver, makes up a neat 50 metre vacume portable. All resistors are $\frac{1}{4}$ watt unless otherwise noted; all capacitors greater than one are silver mica in m.m.f. and less than one are disc ceramics in m.f.t. unless otherwise noted. The 1 m.f. and 0.2 m.f. in the keyer circuit should be low loss Mylar types.

BL-3-15 v. battery Burgess type Y10
CL-100 m.m.f., A.P.C. type with $\frac{1}{4}$ in. shaft
CR-85-340 m.m.f. El Menco L-30 compression
trimmer.
CRI CR2-0.25 amp. 400 v. p.l.v. diodes.
L1 35 turns 26 gauge tinned wire wound up
from ground wound on National XR-50 former
L2 13 turns 26 gauge tinned wire wound on
National XR-50 former.
L4-5 turn link of hook-up wire wound on cold
end of L2.

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plate coil was peaked up for maximum drive and output. The final tank circuit was link coupled direct into a 50 ohm carbon resistor for this adjustment and field strength meter watched for maximum indication at this frequency.

The grid circuit of the 6360 should draw about 2 mA. which is all that could be obtained from the v.f.o. Normally the 6360 uses 3 mA. of drive to obtain 100 mA. plate current. We could get 65 mA. with 2 mA. drive. More could be obtained by experimenting with the tap on the v.f.o. coil in conjunction with varying the grid resistor in the v.f.o. and 6360. Increasing the screen to its normal 200 volts does not seem to improve anything. A little

more could be squeezed out by using capacitor input filter but the difference in signal strength does not seem worth the regulation trouble.

The output of the final is coupled to an L network on top of the chassis. The idea is that any length of wire might be used when on vacation. In a motel, a 25 foot length is about all you can hang in the room while in a mountain cabin you could get quite a long run. You will have to experiment for the number of turns for your particular installation. Using 60 feet of wire strung out the window, I found the coil, tapped six turns from the coaxial input end, loaded it up to 65 mA. when the capacitor was peaked. This is 18 watts input.

This is enough power, on 80 metres to really get out. We have worked Arizona, Nevada and stations to the north of San Francisco with S9 reports on the 80 ft of wire.

The Gas regulator tube should never have more than 25 mA flowing through it and the 8K series may have to be adjusted. As long as the VR tube was there, we decided to use it on the local oscillator of the 6K8, to help stabilise signal drift. The pin connection on the oscillator coil is number five and the 150 volts regulated can be fed here when the wire is cut and another outed to the relay.

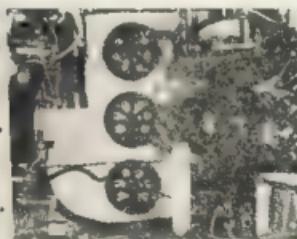


Bottom view of the front section of the modified ARC-5 with the coil bank removed showing the tuning capacitor in the upper right corner with its XR-55 coil form to the right of it. The relay, K1, may be seen in the upper right corner.

THE CABINET

This nice looking cabinet is just a piece of do-it-yourself from the local hardware store. It was bent and slipped over the whole chassis. What could be simpler? The bezel was added for looks, and is one inch wide, and tapered at the bottom.

The total weight, with key and antenna, checks out on my bathroom scales at 10 lb., and easily going by air. Either way, driving or flying, on a trip this little rig will give you many enjoyable QRM free QSO's on the 80 metre band!



Bottom view of the rear section of the Joystick transmitter-receiver. The upper right corner is occupied by the power supply with the diodes mounted on a board against the chassis flange. The key jack is located in the upper left corner. The bottom right hand corner contains L3 and the miniature delay pot for the keyer circuit. The new receiver output transformer is in the lower left of the chassis.

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The Historical Development of Radio Communication

PART SEVEN—THE PRESENT SITUATION AND FUTURE TRENDS

J. R. COX,* VK6NJ

CHAPTER SIX

Wireless communication advanced technically under the auspices of three main contrivances; the spark-gap transmitter, the thermionic valve and, recently, the transistor. Within the framework of this trio other developments eventuated, amongst which were improvements in valve design, circuitry design, antenna effectiveness, the propagation characteristics of wave radiation, wireless telephony and broadcasting techniques. All combined, meant the advancement of radio as a whole. Wireless circuitry progressed from detection without amplification to Tuned Radio Frequency reception, which gave amplification at the frequency at which the signals were transmitted. Another innovation was the Armstrong regenerative circuit which made loudspeaker reception possible. Superheterodyne circuits gave higher amplification and greater selectivity, with the added facility of automatic volume control.

Mention of the system called frequency modulation has been made in Chapter Three,¹⁰ and another modification to methods of transmission was introduced in the 1930's. The technique, called single sideband transmission, is finding increased use at the present time. It was realised that a fully modulated, amplitude modulated signal carried two-thirds of its power in the carrier and only one-third in the sidebands. This represents a waste as only 'The sidebands carry the intelligence to be sent; the carrier goes along for the ride'.¹¹ As a means of using the transmitted power to greater advantage, it was decided to eliminate the carrier and transmit either one sideband or both (called suppressed carrier system). The carrier is easily reinserted by a heterodyne-type receiver for normal demodulation and it is claimed that the single sideband system can give an effective gain equivalent to increasing the transmitter power eight times. The system also has the advantages of conserving spectrum space and eliminating phase distortion.

So far this thesis has outlined the course of development through which wireless communication has passed to enable man to hear and speak at a distance. There is yet another opening of wireless communication which enables man to see at a distance. This is, of course, called Television.

Television, strangely enough, was envisaged before the advent of practical wireless communication, it being proposed as an adjunct of wire telephony. The history of television can be traced back to a Mr. Joseph May, a telegraphist in Ireland, during 1873.¹²

¹⁰ Government School, Yornup, W.A.

¹¹ See Appendix 4, The Process of Modulation.

¹² American Radio Relay League, "The Radio Amateur's Handbook," 1938, 36th edition, p. 304.

¹³ From a fifteen-page paper, "Television—A General Survey" by John L. Baird, addressed to the World Radio Convention, Sydney, April 1938, Institute of Radio Engineers, Aust., op. cit.

He noticed that sunlight shining on selenium resistors varied the current flow in a circuit of which they were part. May reported this phenomenon and from subsequent investigations came the "selenium cell" which has the ability to transform light impulses into electrical impulses. Then arose a query. Could such a cell form an electrical "eye" for transmission of different shades of light? After all, Bell's microphone was an electrical "ear" which changed the voice into a varying electric current. Why not use the same principle to send pictures composed of varying shades of light?

A number of inventors accepted the challenge and amongst them was Maurice Le Blanc who, in 1880, proposed a system of mechanical scanning. He contended that mechanical scanning would break down the picture into many parts for transmission one at a time. Four years later, a German, Paul Nipkow, put the idea into practice by fabricating a perforated disc, the holes of which were arranged in the form of a spiral. When an image of the object to be transmitted was focused on the disc, light from every part of the object fell successively on a selenium cell placed behind the revolving disc. The varying current was then to be sent to the receiving point where a device described by Michael Faraday and another spiral-punched revolving disc combined in action to return the incoming electrical impulses into the impulses of light which made up the original image. The arrangement failed because the selenium cell was not capable of producing sufficiently strong electrical currents. Amplification was possible after the arrival of the three-element valve and in 1906 Hans Knudsen used mechanical scanning to transmit photographs by wireless. For some years afterwards the Nipkow method was experimented with, but the mechanics of the device prevented progress to a really satisfactory standard of viewing. To achieve this the picture needed detail, contrast and no flicker, and it was realised that some means of electronic scanning was needed to produce this result.

As early as 1907 Mr. A. A. Campbell Swinton extolled the use of cathode ray tubes as a transmitter and receiver of television pictures, but it was not until 1923 that his idea was implemented. John L. Baird, sometimes referred to as the Marconi of television, successfully applied cathode ray tubes in that year to transmission and reception of shadows.

The first demonstration of true television occurred in 1926 when Baird transmitted the picture of an office boy named William Taynton. Television even reached across the Atlantic in February 1928 to a vessel S.S. Berengaria. Long wave transmission was used and the picture was not sharp or clear.

All-electronic scanning was made possible by the development of television cathode ray tubes in 1929 and

these were the direct result of Campbell Swinton's earlier investigations. They were produced for television by an English company, Electrical and Musical Industries Ltd., and marketed under the name of "Emiton".¹³ In America around the same time, Dr. V. K. Zworykin, of the Radio Corporation of America, developed a similar device with which the first public demonstration of an all-electronic television was made in 1929.

The use of ultra short waves¹⁴ from about 1930 onwards paved the way for transmission of more detail in pictures, and from 1932 television emerged from the experimental stage to that of public use. Television was installed in 5,030,000 homes in the United States of America in 1950 and by 1960 this figure stood at 46,200,000.¹⁵

Public broadcasting has not been superseded by television. In fact it is claimed that radio has more listeners than ever before. This could be because of the increased accessibility of wireless. Transistor receivers are small, convenient and can be taken anywhere. Radio broadcasting has changed its role to suit the new-style audience of beachgoers, sportsmen, travellers and the teenage population. For the most part there is not so much emphasis on quality of programme format as before television when radio was the home entertainment. The light juke-box type of programme now predominates.

There seems little doubt that television and radio will continue to exist side by side. With the extension of experiments in using satellites as reflectors, inter-continental transmission of television could well become as common as short wave public broadcasts are now.

At the present time wireless communication serves four main purposes; those of television, medium wave broadcasting, long range telephony and specialised communication such as tele-printer and picturegram services. Research is now going on aims at the continued use of radio in at least these four divisions. The indications are, however, that the physical form of wireless equipment will become smaller and smaller. This trend is not unique to radio, as other useful objects have undergone a similar pattern of diminishing size as they were developed. The grandfather clock to ring-sized watch is but one example of this.

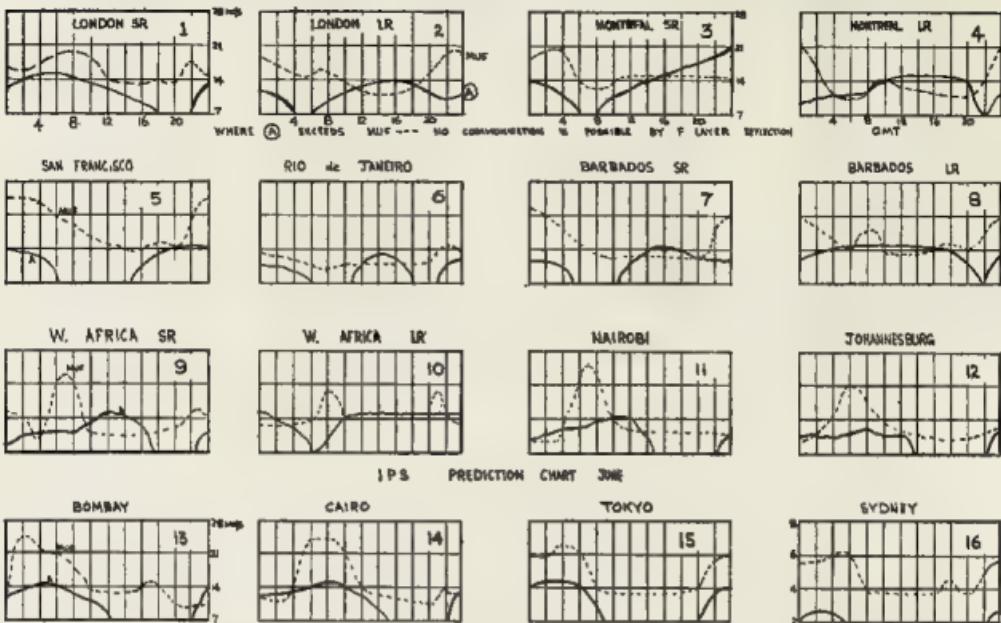
The trend towards miniaturisation is especially noticeable in field and domestic radio appliances and this move to smallness really started with the advent of the 1.5 volt sub-miniature thermionic valve. Reduction in valve

¹³ From a twenty two page paper, "The Development of High Definition Television in Great Britain" by J. D. McGee, addressed to the World Radio Convention, Sydney, April 1938, Institute of Radio Engineers (Aust.), op. cit.

¹⁴ Radio waves with a wavelength ten metres or under.

¹⁵ United States Bureau of the Census and from a letter ex State Library, James Street, Perth, and July, 1962.

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size made overall size diminishment possible and by 1948 the reduction in equipment extent was quite noticeable.

Shockley, Bardeen and Brattain opened up the next stage of miniaturisation with their discovery of the transistor. The miracle of the transistor is that, despite its smallness, it can do better just about anything that the subminiature valve can do. Requiring only low voltages, this device has brought about a remarkable decrease in size and weight of communication equipment because these two factors are proportional to the voltage used, power handling capacity and heat dissipation. Transistor usage in communication equipment gave rise to associated techniques such as dip soldering and printed circuits, both of which facilitate simple assembly and reduction in volume. In addition, new lines of components in the form of miniature capacitors, resistors and switches made possible further reduction in size and weight when compared with subminiature valve equipment.

Thus transistors, themselves minute, together with associated components and construction techniques, have produced a remarkable shrinkage in overall size of equipment. The parts placement density of transistorised equipment is said to be capable of achieving 50,000 parts per cubic foot. By comparison, the "handle talkie" transceiver which is regarded as the ultimate in miniature valve designed equipment, achieves a parts density rating of 8,000 parts per cubic foot.¹²

A military demand for greater miniaturisation than 30,000 parts per cubic foot has launched a programme with the aim of microminiaturisation in field-type equipment. This need arises from the foreseen requirements of wireless sets to be minute in the event of nuclear blasts. The fulfilment of a programme in micro-miniaturisation depends upon a new concept in radio equipment called the modular concept, which has a minimum aim of 500,000 parts per cubic foot and the possibility of a further tenfold reduction.

The modular concept in electronics centres around the evolution of micro-miniature components of uniform shape and size which combine to form tiny modules. Each module is assembled as a micro-circuit capable of complete function such as an oscillator, modulator or any other block section of a receiver or transmitter circuit. There is a variety of assemblies and any number of interconnections of modular circuits is envisaged possible.

Modular circuits are constructed in wafer-like forms 0.310 inch square and 0.010 inch thick. Shapes of components as we now know them disappear. Resistors, for instance, are made by depositing metal or a metal oxide film, and fixed capacitors use ceramics, while inductors use toroids between two micro-wafers. Variable tuning condensers are replaced by highly sensitive, low voltage, semi-conductor diodes which exhibit variable capacity. Since the programme began in 1958, it has been found that all electronic parts now used in wireless equipment can be reproduced in the modular concept. It

seems very likely that the transistor set now considered small may soon be bulky by comparison with its modular counterpart.

The call for miniaturisation has brought about a change in the radio industry itself. In the past a designer could alone work to create new equipment, but now, because of the great complexity of the factors involved, the days of the sole planner are gone. The modern designer has to consult with many specialists from many departments of science and industry to get the overall picture; the chemist, engineer, physicist and mathematician all have something to contribute. The transistor heralded the opening of the miniaturisation era in 1948 and this has now extended to a period of micro-miniaturisation. It is also the era of the specialist because, now, "the maximum amount of knowledge is the minimum required"¹³ before new designs can be created and the minimum amount of knowledge is beyond the capacity of a single mind.

Small equipment needs a ready, reliable source of power and here specialised development in primary cells has assisted the fullest exploitation of miniaturisation possibilities. As well as a demand for size reduction in wireless batteries, there is an insistence upon a reasonably long life. Miniaturisation of the standard torch-type battery does not lend itself to this requirement, but new techniques have evolved tiny batteries which, in themselves, amount to a scientific breakthrough.

Later development of the electrochemical cell, using zinc and mercury, devised by Dr. Samuel Ruben during the Second World War, has proved of tremendous assistance. The advantage of the mercury-type cell is that it has a capacity something like seven times as much as the Leclanche torch-type cell. This means less bulk without loss of power availability.

An announcement of a major breakthrough in the actual conveyance of intelligence from one place to another was made in May 1963.¹⁴ This concerned the Pseudo Random Intelligent Noise Transmission System. Labelled "P.R.I.N.T." it is a completely new concept in wireless communication although it does still use the electromagnetic spectrum and some conventional transmitting components. The system revolves around a new thought in tuning and modulation. Tuning depends upon time and not frequency as we now normally expect, whilst the modulator converts intelligence into a pulse code which is emitted by the transmitter. To receive the information the receiving set must start at the same time and remain in phase with the transmission. In this manner the pulse code is converted to our natural means of reading and hearing. Many such transmissions using different time starting points and different codes may be accommodated in the spectrum space of one conventional transmission. This system is very much in its infancy, but it does present a picture of overcoming the problem of overcrowding as more and more stations come on the air.

Another new concept called "Laser" is currently under intense research. The Laser is a new electronic device which has the ability to amplify light waves and intensify them into a single powerful beam. American scientists prophesy the use of such a beam in a communication system. This system could, in theory, use a beam of light to carry all the radio, television and telephone broadcasts currently transmitted throughout the world.¹⁵

Since practical wireless began, its progress has been motivated by the need to improve on what has already been discovered. Each step forward has brought with it a new challenge. This is so today. From the turn of the century the challenge has been found in the need to perfect techniques and equipment, but it does appear that the zenith of technical perfection, with present modes of transmission, may be reached by the current programme of micro-miniaturisation. What, then, of the period beyond? Wherein lies its challenge? The answer seems to be in the problem posed by the future need to accommodate many more wireless stations and their operation without mutual interference. This problem is becoming increasingly apparent and the time could arise where there will not be sufficient band space available. The wider use of single sideband transmissions will help overcome the question, but the real solution may only be found in a new mode of conveying intelligence from one place to another. The indications are that the radical P.R.I.N.T. and Laser systems may one day prove suitable for this purpose.

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(Continued on Page 22)

¹² Gilbert, H. D: "Miniaturisation"; Rheinhold Publishing Company, New York, 1961, p. 105.

¹³ "Amateur Radio," Journal of the Wireless Institute of Australia, May 1963, Melbourne, p. 1.

¹⁴ Laser is derived from a phrase that describes the device's function: Light Amplification by Stimulated Emission of Radiation. Two-page article by Bruce Shore in "Radio, Television and Hobbies," February 1963.

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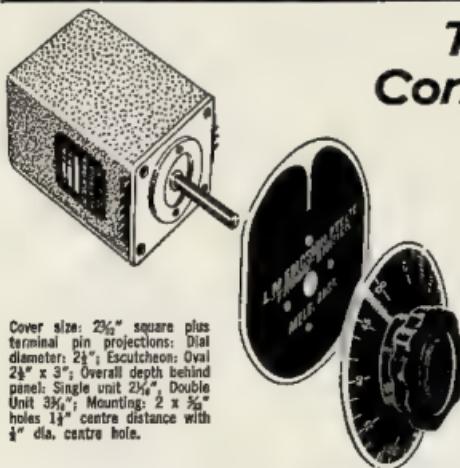
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W.I.A. Federal President's Annual Report, 1964-65

It once again gives me pleasure to present to Federal Council the activities of the Institute in general and the Federal Executive in particular for the past 12 months.

This year has been a quiet one for the W.I.A. in which it has had the chance to strengthen itself and take stock of its current and future prospects. In other respects it has been an upsetting year. On the 28th August, 1964, the Institute lost one of its most loyal supporters and officers to the Lord. Jim Conroy, B.E. VK3CJV, who died after a short illness.

Jim was responsible in no small way for strengthening the N.S.W. Division, and although his "stormy petrel" he always had the Institute's interests at heart. He did it with his great drive and enthusiasm that enabled N.S.W. to drive and maintain the property at Dural and obtain a permanent home at Althorne Street, Crown's Nest. He will be missed by the W.I.A. and the Commonwealth Government, particularly his own Division. The Executive also lost the services of the Secretary through illness for some three months during the year. This could not have occurred at a worse time in the year. The Committee was not fully prepared and the Secretary's job had to be shared between the Vice-president and myself.

On a brighter note, the Executive were asked to once again co-operate with the Boy Scout movement in setting up a station at the 1964 Australian Jamboree, which was held at Roseville, near Dandenong in Victoria. The station was in a sudden illness of Mr. Glover who was to organise the various facilities, Mr. David Rankin stepped in at short notice and did a superb job. The station, VK3WIA, the Federal station of the Institute, was eventually set up in a portable army hut on the site and the equipment installed. The station was in every way a credit to the Jamboree and I believe it was an outstanding success. I personally wish to record my thanks for the great assistance to David and myself of those providers of equipment, both commercial firms and Amateurs, who gave their time, equipment, technical teams and others too numerous to mention by name, who gave of their time and energies over the Christmas/New Year period. Cards are now being prepared to acknowledge those with whom we have had contact and those stations who contacted VK3WIA during the period. I am sure that the effort was well worth the trouble as judged by the continuing interest of Scouts and their parents who visited the station. Personal letters of thanks have been sent to all those firms and Amateurs who assisted.

What speaking of VK3WIA I wish to report that further smaller items of equipment have been delivered during the year, including two transmitters. The old transmitters bought at disposal from the Air Force have now been sold, and one of the receivers also. I believe it is essential that the Federal station should have modern standards of equipment and I hope in liaison with overseas stations, I hope that VK3WIA will be on the air more regularly during the next 12 months.

In dealing with I.T.U. matters I wish to say that the official Government report on the results of the recent space service conference in Geneva has not yet been released, although basically the details stated in my last report to you are valid. No I.T.U. conference of interest to the amateur has been held during the last year and at present is the date of any forthcoming conference unknown. However, I trust all those Divisions who have not yet filled their quota of subscriptions, set by Sydney in 1963, will continue to do so, and further participation. Only VK7 and VK8 have filled or nearly fulfilled their promises.

The activities of W.I.C.E.N. the Institute Emergency organisation, received a severe test during February and March, 1965, in the form of severe areas of eastern Victoria, New South Wales and to lesser extent South Australia. At the time of preparing this report little news is available from New South Wales or South Australia, and reports from Victoria, which had been most effectively with many mobile stations talking part and performing a most useful service to the community. VK3WIA was on the air for most of the period, as was the commercial station at Lockwood, and the amateur stations were most lavish in their praise for W.I.C.E.N. and very good T.V. and newspaper publicity was obtained for the Institute. I trust other Divisions will take note and ensure that they also have effective units which can go into operation at short notice. Those who took part are to be congratulated on a sterling effort which has undoubtedly enhanced the Amateur image with the general public.

Membership figures for the W.I.A. show gradual increases as license figures continue to rise. I would like to be assured that Divi-

sions are doing everything possible to hold their membership particularly with the new licensees. A sound progressive programme of recruitment is the only way to achieve greater status in the eyes of the public. As the President reported, our ultimate aim should be to represent every Amateur in Australia. The membership figures (which include all grades of membership) and licensees are shown below for the last three years:-

| | 1962 | 1963 | 1964 | |
|--------------|-------|-------|-------|-------|
| | M. | L. | M. | L. |
| N.S.W. | 1,303 | 1,437 | 1,172 | 1,605 |
| Victoria | 765 | 1,382 | 728 | 1,021 |
| Queensland | — | 269 | — | 512 |
| S. Australia | 341 | 545 | 582 | 514 |
| W.A. | 318 | 317 | 316 | 324 |
| Tasmania | — | 174 | 184 | 154 |
| V.K.I. S. G. | — | 180 | — | 123 |
| | — | 3,205 | 4,314 | 3,779 |
| | — | 4,055 | 4,655 | 3,959 |

Total ... 8,365 9,434 8,009 8,605 8,260

*Estimated.

I must once more express disappointment at the failure of some Divisions to forward their monthly membership returns. I ask all their Federal Councillors to impress on their Divisional Presidents the importance of regularly forwarding these figures. The Federal Treasurer must have correct figures on which to apportion financial payments and they are also required from time to time for official purposes.

The Youth Radio Club Scheme still continues to grow and new clubs have been formed during the year. The separate report from the Federal Y.R.C. organiser, Mr. Rex Black, VK3YRC, gives a detailed account of the activities. I take this opportunity to thank all those who are helping with the clubs and Mr. Ken Matiel who regularly presents the activities with his notes in "A.R." I urge Divisions where the Y.R.C. is not represented to consider it and just starting to give this aspect of Institute activities every assistance possible, for the recruitment in this field will eventually make itself public and a valuable asset to the Institute.

We have continued our liaison with overseas societies, principally the A.R.R.L., R.E.G.B. and N.Z.A.R.T. in regard to regulations, publications and contests. The A.R.R.L. through I.T.U. have been proposing a series of articles on each member society in regard to their regulations, operating procedures and various society matters. Mr. John Munro, the general secretary of A.R.R.L. and secretary of I.T.U. has sent me the draft of the first of these articles to be written up in QST will be the W.I.A. He has also informed me that it is most likely he will be visiting Australia in the near future. I hope that during the next 12 months we will be able to establish closer liaison with these and other societies per medium of regular radio contacts. The sub-committee formed to enquire into the F.C.C. organisation, comprising the Victorian Federal Councillor, the President of the W.I.A. and the Executive, has now completed its work. It has also received valuable information and assistance from the A.R.R.L. A final report will be issued when all the facts have been sorted and examined.

The Executive has communicated with the P.M.C.V. Department in relation to regulatory matters raised at the last Convention, and all Divisions have been notified of the results. Some of the replies have not been in our favour and some comments made could be removed during the next 12 months. Mr. Len Pearson, contrary to my last report, has not yet retired and his time has been extended until the latter part of this year. His likely

successor is not known at this stage. On the few occasions of liaison with the local Victorian Administration, their co-operation has been most helpful and cordial.

The Publicity Committee has continued its onerous task of preparing "Amateur Radio" each month for printing, and I still consider Divisions could give more assistance with articles and in seeking advertising. The day is approaching when a similar contract will be laid at the door of the Publications Committee for it was due to lateness of checking by the various State controllers. The General Adm. department personally apologised to me for the delay and will not do it again. It will be noted again incidentally, our contract with the Department has been renewed for another five years for the publication of the "Callbook". The detailed report by the Editor of "Amateur Radio" will be a good idea.

Finally, I thank all those who have been involved in the work of the year, particularly the Editor and his able assistants for the way in which they continue to give a lot of time and energy but receive very little outside help. The contests were well supported during the year and were conducted by the Contest Committee located in Queensland. Unfortunately for most of the year, only one member could devote time to this sphere resulting in inactivity in this sphere, particularly in the R.D. Contest which I understand will be in the May issue. Congratulations to South Australia who once again has won this contest. All of the Federal Committee were well represented and supported the R.D. Trophy has been repaired and refurbished and it is proposed to also refurbish the R.D. trophy if necessary. The issue of awards has continued under the direction of Mr. John Munro, VK3YRC. The production of the new W.F.D. certificate has been delayed due to the lack of a suitable design and motif. A draft is expected in the near future. I have signed over the throughout membership of the W.I.A. and all Divisions should now have had their first awards; more will follow as time permits. A draft of each of the S.W.L. certificates has been produced and these together with the rules will be issued during the next month.

Activities on the various Amateur bands have been spasmodic depending on contests and conditions for the largest amount of local activity. Conditions have been again encouraging and I am becoming more and more aware that Amateur A.M. is on the way out. There are always some s.s.b. stations operating when the bands are otherwise quiet. The voluntary sub-division of the h.f. bands has now been completed and I trust Divisional broadcasts will regularly publicise these frequencies. On the v.h.f. and higher frequency bands activity is as great as ever and distance records continue to be broken. VK3WIA has taken the Mc. G. record with a distance of 1,400 miles to New Zealand VK3LAE and VK3LZ have been active on the 432 Mc. and their record stands at 262 miles. Congratulations to these and many others who continue to pioneer these frequencies.

The work of the co-opted officers has continued with little worry or fuss, and Messrs. Klemick (Awards), Jones (S.G.), Springfield (Contests), and Currie (Publicity) have carried their Black (Y.A.C.) carry on their important jobs in the usual efficient way. I thank them all for their continued devotion to their jobs.

Regarding the financial state of Federal Council, I refer to the audited statement pre-

(Continued on Page 22)

WIRELESS INSTITUTE OF AUSTRALIA — FEDERAL EXECUTIVE

Balance Sheet as of 31st February, 1965

| Liabilities | | Current Assets | |
|---|--------|--|--------|
| Trust Fund | £221 | Commonwealth Savings | £2,481 |
| I.T.U. Fund | 1,164 | Trade Debtors | 95 |
| Accumulated Funds | | Stock on Hand — at lower of cost or market value | 173 |
| Balance 1st March, 1964 | £1,000 | | |
| Add: Income | | | |
| Surplus of Income over Expenditure for Year | 443 | | |
| Surplus on Revaluation of Equipment | 21 | | |
| | 1,065 | | |
| Fixed Assets | | (At cost less depreciation) | |
| Furniture and Fittings | | | 13 |
| Typewriter (No. 1) | 10 | | 72 |
| Typewriter (No. 2) | 10 | | 19 |
| Duplicates | — | | 85 |
| Trophies | — | | 14 |
| Equipment | | | 349 |

£1,065

£1,065

ATTENTION V.H.F. OPERATORS

We have obtained the franchise for the GONSET CO., makers of the most advanced
6 and 2 METRE S.S.B.-A.M.-C.W. TRANSCEIVERS

See the write-up on page 64 of the March, 1965, issue of "QST" on the 2-metre GONSET SIDE-WINDER, a compact solid-state 20 W. P.E.P. 2-metre Transceiver for 144-146 Mcs.

We have these Transceivers on order already and their estimated retail price, tax inclusive, will be £270 (\$400 in the U.S.A.). Power supplies, A.C. or D.C., are extras.

Also on order a GONSET 2-metre Linear Amplifier using a 4X150A valve, with self-contained power supply, estimated at £250.

On special order the same equipment is available for 6 metres operation.

Orders for this most advanced equipment, offering the same operating convenience as now already standard on the d.c. bands, at comparable prices, can be made for expected delivery in July, 1965.

SIDEBAND ELECTRONICS ENGINEERING (ARIE BLES)

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SPECIFICATIONS:

Output Impedance 50 ohms or 50K ohms
Effective output level -55 db. [0 db. — (one) 1V. Microbar]
Frequency response 50 to 15,000 c.p.s.

OMNI-DIRECTIONAL DYNAMIC:

Plastic Diaphragm. Swivel fits 5/8" 26 t.p.i. Stands.
Size: 4 $\frac{1}{2}$ " long, 1 $\frac{1}{4}$ " diameter. Colour: TWO-TONE GREY.
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Book Review

SHOP AND SHACK SHORT CUTS

By Donald L. Stoner, WSTNS

You could also call this publication "Encyclopaedia of Hints and Kinks."

When this volume first came into my hands I began to wonder who would consider spending 50/- on such a book? As the pages were turned many old tricks were again revealed. Some of them with a new twist added to make them topical. Again I asked myself the question: Who would buy?

Yes, even after 30 years' experience in Amateur Radio and Electronics, in general I would say that this publication is a "gold mine" ... It could save its purchase price the first time it is used and it will never go out of fashion, as so many books do.

The book is divided into 13 chapters, grouping tips under the following broad headings:

- (1) Improve your Shop Technique;
- (2) Tips on Crystals and Holders;
- (3) Coil and Condenser Hints;
- (4) Ideas for the Shack;
- (5) Improve your phone rig;
- (6) Hints for improved c.w. operation;
- (7) Receiver improvements;
- (8) Transmitter improvements;
- (9) Antenna improvements;
- (10) Power supply ideas;
- (11) V.H.F. hints;
- (12) For the mobiliser;
- (13) Test equipment.

There is something for everyone interested in construction projects. S.W.L.'s ... The younger generation of new Amateurs and the "old hand." There is something for all, grouped neatly into one volume.

Publisher: Cowan Publishing Corp., Port Washington, N.Y., U.S.A. Australian Retail Price 4/-, plus postage 1.5/- Available from Technical Booksellers, 285-299 Swanston Street, Melbourne, C.I. and McGill's Agency, 183-185 Elizabeth Street, Melbourne, C.I.



WORLD RADIO T.V. HANDBOOK, 1965. 19th Edition.

This latest edition of the "Who's Who" of the radio and T.V. world has been completely revised and brought up to date in every respect—not only as an extremely comprehensive guide to the radio and T.V. stations in the world, but also in regard to the editorial content.

To anyone even remotely interested in short-wave listening, this book should be a must. Not only does it provide full information about the broadcasting and T.V. stations in each country of the world, including frequencies, power, QSL addresses and other relevant data, but a table at the back of the publication lists in order of frequency short wave stations in the world between 2180 Kc. and 26,000 Kc.

For the serious S.W.L. the book would be worth obtaining for this information alone.

Some of the best-known international personalities within radio and T.V. have provided interesting articles on such subjects as Interference, Jam-

OSCAR III

After delays amounting to nearly 12 months, Oscar III was finally launched on 9th March, 1965, into a near polar orbit at a height of nearly 600 miles, just as hoped for.

Unfortunately, it was soon obvious that it was not working as well as expected, in that the c.w. beacon did not function; the telemetry beacon, although at fair strength, did not give data on the two temperatures, but only one (which one?); and the overall translator gain was down by about 20db. This meant that whereas a 30 watt transmitter and average type of aerial should have been sufficient to relay signals through the translator, in actual fact the only QSO's made over transcontinental distances were by stations running near a kilowatt into high gain aerials tracked in elevation as well as azimuth.

It is suspected that the poor performance may have been because of damage to the satellite aerials which may have occurred during the launch or injection into orbit. In the VK-ZL area the only signals relayed over any distance were on c.w. and heard only for seconds. They included VK3ATN, VK7PF, VK1LZ, ZLSAR (running 500 watts under special permit), and a ZL1 (believed to be ZL1DE), who was heard briefly by VK1VP. There may have been others; we apologise for any omissions.

Overseas DX included W1 to HB8, DL3 to W6 to KH6, KL7 and LU3. Many of these QSO's were on s.s.b. and powers of over 500 watts were the rule.

At the time of writing (12th April, 1965) the telemetry is still in operation, having switched over to solar cells, when the main battery failed on 27th or 28th March. Although the telemetered voltage fluctuates between 11 and 13 compared with the original 20 volts soon after launch, it is quite possible that the beacon will continue to function indefinitely. If so, it is to be hoped that its orbits do not clash with Oscar IV and cause QRM.

Oscar IV, identical to Oscar III, but (we hope) fully serviceable, may be launched in September. Here's hoping we make those 4,000-mile 2-metre contacts yet.

—Bill Rice, VK3ABP.

ming and You, Solar Activity in 1965, Inter-continental Television, Short Wave Reception Conditions expected during 1965, "Where to Listen for Satellite Signals," lists all satellites and their frequencies and also those expected to be launched during 1965.

Tables of interest include: The Most Suitable Metre Bands for 1965, Standard Frequency and Time Signal Stations, DX Programmes, Radio Stations Broadcasting in Your Language, World Time in All Countries, and Call Sign Allocations.

The book is a soft cover publication 8½ in. by 8½ in., containing 302 pages, and is available from most leading booksellers.

YOUTH RADIO CLUBS

The big news this month comes from Sydney Teachers' College where a newly formed club (with leaders Mr. M. Henderson and Mr. Dick Smith) has 25 members. This is one of the most important breakthroughs we could have, and the Divisional Council will make it a priority matter to achieve the same result. I'll be surprised if this doesn't mean the new Y.R.C.'s in 1966 in VK3. The president of the VK3 Club is Maurice Coleman, graduate B.Sc. and Dist. Ed. student, who hopes to have his A.O.C.P. early next year. Also, judging by the number of lady members, it looks as though some girls' high schools in Melbourne will compete with St. Agnes and Melbourne Girls' Grammar. This likely expansion is great news. Would Publicity Officer Fensy please not copy—it may give your uncontrollable meetings the cold horrors!

Another important matter is the education of our political leaders in the possibilities of the Y.R.C. Any day now there will be screaming in high places about the scarcity of engineers destined to lead the nation. Electronic laboratories are now being purchased as our bomber-fighters. If you care to educate an M.H.R. or two, Mrs. Betty Genders, secretary of the VK3 Division, has duplicated copies of the R.Y.C. Scheme and detailing the amazing Soviet Youth Training Scheme. If you send her a stamped addressed envelope marked "U.S.S.R. Info," you will have material to be sent to an M.H.R. with a ringing letter emphasising that the W.I.A. organises a valuable voluntary scheme but the W.I.A. cannot match the U.S.S.R. by itself. All States should join in.

The two regular stalwarts, Jim Webster and Ken Matchett, keep their bulletins going from VK3 and VK3. This is an important activity because it makes all the club leaders feel that they are part of a broad-based network of interested units. Ken has included in his 1964 Annual Report in VK3 in 1964, 83 Elementary and seven Junior Certificates were awarded, including the first at Primary School Gordon Park. Two new clubs are welcomed: Australian Air League Squadron and Melbourne High.

In VK3 there are more clubs registered in 1964 at this date. Full count is not available yet. Club bush news is available though. As Gosford Gary Tippett has received call-sign 2LX and is designing and constructing with the aid of Lindsay JOHN, Mr. Arthur PEARCE, Mr. G. W. T. (Peter) (Master Teacher) has introduced a Y.R.S. course for 2nd year pupils as a craft (all high schools please note and suggest similar). North Strathfield Scouts are active with call-sign 2MHA. Hordern Boys' Scout Troop 2075, Baulkham Hills, is being organised by teacher Jack 228. Hunter's Hill High has a club led by Science Master Mr. L. MacKenzie. Westlake goes on to greater strength under Keith 2AKK. Waverley College has a club for 18 to 21 members and meets every week. Baulkham Boys' High with Jim Webster is helping the Cadet Unit with some transmitters and designing antennas. Punchbowl Boys' High is still organised by Steve Webster. McDonald's Kurnell North High is a predominantly junior group that keeps Rex 2YA late home. Inverell High is still organised despite the transfer of Roger 2AVY. Kyogle Scouts with Garry 2KJL are active. Waverley Peak Hill Central is a new club led by a Science Teacher, Mr. A. Tookey. Port Street High is again led by Mr. Wein. Waverley College has formed a club led by Brother P. Anderson. Dorrigo High is a new club, led by Science Master Mr. A. Brown.

In Canberra the Y.R.C. types had a lot of fun at the Capital Radio Society's Easter Convention. Roger 1RD was first in the Hidden 7 Mc. Tx. against Inter-State competition and Jim 1JR won second prize in a Receiving Contest. Andrew Davis turns 15 next month and may be on the air (VK1AD) with his 7 Mc. transceiver (home-brew) when you read this.

There is news also from both VK6 and VK4 of L.A.O.C.P. passes. In Wesley College Club, Perth, Laurie 2EZA has four members who obtained Commonwealth Scholarships. They are Peter Pemberton 2E2P, Guy Geddes 2E2Z, Terry Brown 2E2M and Michael 2E2L, two of whom have passed L.A.O.C.P. and are waiting for call signs. In VK4 a De La Salle Club member and one from Grammar School (aged 15½) have L.A.O.C.P., but no details of names. In New South Wales, those projected are Maryborough State, Rockhampton, Christian Brothers, Gladstone, State, Cairns Boy Scouts and St. Patrick's Mackay. 1KMK.

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WFS500 Power rating 500 watts; peak.

WFS500 12v. d.c., full 500 w. with reserve. 850v. 500 mA. 275v. 250 mA. 120v. Bias. Size 6" x 4" x 5". Price £56, plus 12½% sales tax.

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WFS240AC 240 a.c. 500 w., same voltages and current rating as WFS500, plus 12v. a.c. for heaters, and 12v. d.c. for relays. Steel cabinet and full transformer isolation.

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Our thanks to all Amateurs and SWL's who ordered or enquired about the National equipment advertised in May "A.R." Some lines still available from stock, others on indent for the present.

SIDEBAND TRANSCEIVERS

NCX3: 3 band 200W. PEP. Full coverage of 80-40-20. LSB on 80 and 40. USB on 20. £297.

NCX5: 5 band 200W. PEP. Full coverage 80-15 and 28.5-29 Mc. with provision for 3 extra 10 m xtals. Selectable sideband. Receiver incremental tuning, etc. £539/10/-.

NCXA: Power supply 115/230v. a.c. input for NCX-3/5. £92/17/6.

RECEIVERS

NC121, £122/10/-. **NC190X**, £214/5/-. for SWL or Amateur **HRO 500** for the discerning Amateur or professional, £1,212/10/-. **TERMS IF DESIRED**.

Also Webster "Bandspanner" and "Topsider" mobile antennas and mounts. Enquire Dept. SI 5.

KEW K109 SWR Meter £9 4 6 **KEW K101 Field Strength Meter** £6 1 6
KEW K102 Field Strength Meter £7 19 6

ALL PRICES INCLUDE SALES TAX. Enquire Dept. RE6 or your Astronic Wholesaler. Webster stock expected late June, '65. Most other lines "ex-stock." Indent orders accepted on items temporarily out of stock. Terms Available.

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Homecrafts-Tasmania,
Astor House, 199 Collins Street,
Hobart; and at Launceston.

A complete spare kit of valves is now in hand except for Type No. CV107. A further two of these tubes are required to ensure reliable operation of the TX at all times. Therefore, chaps, dig deep and check your junk boxes; you may be able to help the project. VK4ZPL.

SOUTH AUSTRALIA

Now that Oscar III has ceased to emit its characteristic H.M. and telemetry signals, it is in his best interest to use his usual winter idleness. It could be assumed, however, that perhaps this acute lack of activity may be due to increased constructional incentive instilled to a large number at the recent I.E.T. group meeting. This meeting, held on 2nd April was most ably handled by Rob VK5BHG and Bob VK5ZDX. The lecture delivery by Rob dealt with the pro's and con's of a.s.b. and v.h.f. sideband transmitter was also outlined, and it is anticipated that the mass production of this unit will be undertaken by the majority as a great project. Bob's subject of the meeting was concerned with the reception of a.s.b. transmissions. His contribution for the evening was emphasised by displaying a receiver that had been modified especially for a.s.b. reception.

Apparently the urge by many to operate on the "gentlemen's" bands accounts for the increased slow Morse transmissions available in VK5 to limited licensed bands down and tails up. At present it appears that VK5 is the leader upon the VK5 v.h.f. records. Official confirmation has been received on the VK5 VK5 2-metre contact between Andrew 6ZCN and Colin 6ZHZ to establish a record of 1,350 miles. Two other long contacts by VK5 types are at this moment also awaiting official confirmation. These are the VK5-VK5 432 Mc. contact between John 6ZDM and Mick 6ZDR.

This contact was made on 19th March at 0832 S.A.T. Signal reports of RS and RS-6 were exchanged. It is anticipated that this contact will constitute an Australian v.h.f. record. The remaining contacts awaiting confirmation made by Trevor 6ZIS and John 6ZJH to Trevor 6ZTM and Rick 6ZVQ on 31st January.

Garry 6ZK and Al 6RK having exploited what the low bands have to offer are reported to be considering a hasty return to the v.h.f. bands. 6ZMJ.

WESTERN AUSTRALIA

The field day on 3rd-4th April kept a few brave Hams quite busy. There were three field stations set up and two cars were operating at different positions in the evening and again the following day. They certainly stood the cold on the mozzies. The latter were 6ZBD and 6ZAZ. The former were 6ZBD, 6ZAG and 6ZDZ, who finished in that order with approximate points 8,300, 6,600 and 4,100. 6ZAG secured the 6th position for four possible contacts with 6ZCN over 120 miles. Andrew was not very active due to T.V.I. and this is one reason for the scores being half as big as last time.

Six metres is very quiet nowadays, most of the guys are having an earful of 30 metres in the shape of VK5CD who a YL runs a most interesting draw of contacts. Now it is a hard somebody like that on 6 ZAK the band would liven up considerably. After a Charlie!

Viv 6ZCM is having trouble with his 2 m. rig. He can only be worked for the first half of any over and then he disappears. This trouble is not at all easy to fix. There may be a gremlin getting mendish glee by disconnecting the other block's receiver after a certain interval. I'd try timing him, Viv.

6ZAG.

Correspondence

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publishers.

Editor, "A.R." Dear Sir.—May I please occupy some of your little column and explain to my many Australian Amateur friends that the sudden disappearance of 6M2DQ from the bands is not due to any calamity up here but because I have now been granted six months leave and am about to go and travel.

I would like to acknowledge the hundreds of QSO's which I have had and enjoyed immensely with the VK Amateurs. These are troubled times but I have only to get on the A.R. and you will be able to sympathise and support from you chaps "down under".

I had hoped on this leave to be able to see Australia and New Zealand but I have to return to England on business and hope later to be able to visit your wonderful country.

Hope to be back at 6M2DQ by October and in the meantime if my VK friends hear a weak signal filtering through from G3KPY in a bad location then please don't forget that I am away.

Yours truly,

Jimmy 6M2DQ.

South-western Zone Convention will be held in Warrnambool. Final arrangements will be given over VK3WI broadcasts.

VK3WK President.
VK3ARJ Secretary.



TRANSFORMERS for special applications!

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("Mullard Outlook", Jan/Feb 1965)
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W.I.A. FEDERAL PRESIDENT'S ANNUAL REPORT, 1964-65

(Continued from Page 15.)

certified by the Treasurer. Although the surplus for the year may appear large, the three certificates outstanding would have very nearly consumed that amount had they been printed as expected. There is a tidy sum in the cash fund and I would like to thank the President for his great business acumen in continuing to bolster this with various F.E. trading transactions. It is with regret that I have to announce that the Treasurer can no longer carry on his present private vocation.

Institute will have lost a great deal by his retirement and I can only thank him for his years of endeavour and it is due to his efforts that the Federal Council is in a healthy position.

During the year Executive held 13 meetings and attendances were as follows: W. Mitchell 12, M. Hull 13, D. Franklin 9, A. Seedeeman 9, J. Lancaster 4, A. Tinkler 3, P. Williams 3, R. Dower 2.

Mr. Peter Williams, VK3HZ, at very short notice, assumed the duties of Federal Secretary due to the early retirement of Mr. Jay Lancaster from ill-health. I thank him sincerely for his hard work and the excellent and courageous job in his stride and I personally am very pleased to welcome him to Executive. I am very sorry that Jay has had to retire but his health is paramount, and I know that all Officers who have had the pleasure of working with him will also join me in wishing him better health in the future and thank him for his four years' service in what I consider the most difficult job in the Institute. I cannot thank him enough for his work and for the enormous thanks to the Vice-president, who helped me through a difficult period when the Secretary was ill. I also wish to thank the remaining members of Executive for their hard work during the year and some of them will again be serving the Institute during the next 12 months.

I wish to conclude this report by thanking all Federal Councillors for their continued support and loyalty during my tenure of office. This year has been a quiet one in some respects but from a public relations aspect I feel we have made considerable progress in relations to bush fire communications and installations and during the Scout Jamboree. The effect of even the smallest of efforts will be reflected in the public eye. Next year will see some new faces on Executive and I wish the new members every success. I trust next year will see the in-

HISTORY OF RADIO

(Continued from Page 13.)

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APPENDIX FOUR

The Process of Modulation

Modulation refers to the process whereby the carrier wave is varied in accordance with the speech or music to be transmitted. There are two ways of modulating a carrier wave: by amplitude modulation and by frequency modulation.

In amplitude modulation the carrier wave consists of a series of waves of constant amplitude. When speech or music is to be

introduced of the Federal Constitution without which I feel the Institute can not make further headway. With a new Federal Constitution and the fruits of some other ideas in improving the Administration I feel the Institute will progress and attain a status worthy of our long history.

—W. T. H. Mitchell.

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transmitted the amplitudes of successive cycles are varied in accordance with the instantaneous value of an audio frequency voltage derived from the sounds by means of a microphone and amplifier.

In frequency modulation the amplitude of the carrier wave remains constant and the frequency varies in accordance with output received from an audio frequency source such as microphone and amplifier.

(The End)

NEW CALL SIGNS

FEBRUARY, 1965

VK2ADI—J A. Stewart, 10 Gore St., Arncliffe, N.S.W.

VK2BCI—G. Kempton, 44, Robinson St., Kangaroo Point, Qld.

VK2BDK—K. Ridgway, 7 Massey Place, St. Ives.

VK2BJD—B. E. J. Dwyer, 38 Highgate St., Bexley.

VK2BKM—K. J. Koslik, 11, The Holdhardt St., Leichhardt.

VK2BWP—P. V. Inglis, 13 Knapack St., Glenbrook.

VK3BWI—W.I.A. N.S.W. Division, V.h.f. and T.v. Group, 14 Atchison St., Crown Nest.

VK2ZJM—P. G. Mack, 18 The Crescent, Cheltenham.

VK2ZKL—G. M. Moffatt, 88 Bathurst Rd., Graceville.

VK3GL—T. J. Dearn, Block 21, Stanley St., The Bath.

VK3KPT—D. J. Kenner, 22 Clarence St., Eustonwick.

VK3AAK—F. E. Westley, Lot 12, Cuthbert St., Heathmont.

VK3ZBH—A. D. Grant, 13 Stott St., Box Hill South.

VK3ZGA—A. D. Swinton, 760 Waverley Rd., Glen Waverley.

VK3ZHI—J. G. Finlay, 84 Carpenter St., Brighton.

VK3ZPT—R. Thomas, 47 Elphinstone St., West Footscray.

VK3ZTV—A. G. Lyall, 616 Bell St., Preston.

VK3ZWW—A. Wallace, 19 Corby St., North Balwyn.

VK4KHL—F. A. Herrmann, 30 Jellicoe St., Toowomba.

VK4JS—A. J. A. Gravina, Flat 1, "Dorsette," 15 Dorchester St., Highgate Hill.

VK4ZDP—D. Parker, C/o 1 Farrington St., Alderley.

VK4ZMC—C. W. McCamley, Main Rd., Maroochydore.

VK4ZNL—N. G. Loury, 81 Prout St., Camp Hill.

VK4ZSP—S. J. Pratt, 83 Chamberlain St., Teragindi.

VK5SQ—D. G. Quarriington, 11 Lassie Ave., Windsor Gardens.

VK5LO—R. K. Westbrook, 42 Chillingworth Rd., Elizabeth East.

VK5ZEP—J. C. Hilditch, 7 Galloway Rd., Christies Beach.

VK5ZJA—A. White, 3 Brookman Court, Blair Athol.

VK5ZMM—M. J. W. Mitchell, Park Drive, Lindendale.

VK5ZSH—G. Hill, 19a West St., Brompton.

VK5GO—D. A. Coddington, 175 Weapons Rd., Wrenbury Downs.

VK6OB—D. B. O'Brien, 8/744 Beaufort St., Mt. Lawley.

VK6SW—W. Stevens, 134 Hillview Tce., Bentley.

VK7TK—B. M. Muir, 186 Montagu St., New Town.

VK7ZLD—W. G. L. Dowi, 33 Jubilee St., Young Town.

VK7ZUW—R. B. Trollope, 69 Federal St., North Hobart.

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It was hard to realize its tremendous size. This station is one of six scattered around the world, which makes one realize how important Australia is in the development of future space vehicles.

Apart from the radio side of the visit to Canberra, there are many other visits to be made—to the War Memorial, Parliament House, the Royal Australian Mint, the general site of this massive Canberra an ideal spot for a vacation as it caters for the Xylo and harmonica as well as the O.M.'s.

Alex VK3AAK is to have a two-week spell in Goulburn, New South Wales, during April, repairing general repairs. He will have a phone beside his bed and will welcome a ring. —VK3AAK.

HUNTER BRANCH

Don't some people go to diabolical ends to make fun of human different to themselves? It seems that they way after hearing the talk given by Alya ZEDM at the May meeting of the branch. The countenances varied from shocked to wildly amused as Alya unfolded his story of amateur activities in VK3. It seems that the organization of these contestants, whom he was closely allied, went to great lengths to make the finding of the FOX a fest like that of discovering the New World. However, Londoners were found among the residents of "The West" and the radio novelties was always found, even though many evil tricks were used in the bidding. Imagine, if you can, the workings of the mind of someone who puts on pants and hats a mile apart, and his human think they are hearing a tone. Apparently sorcery and black magic are illegal in VK3—perhaps just as well!

The president was unable to be at the meeting and guess who stood in for him? He, the press, that is, said that he had just returned from a long car journey, but by the hat he was wearing, I'd say he was just back from Canada with ribbons and all. However, many of the well-known local worthies in attendance Mac ZXMO had brought along his mascot Stan ZAYL was playing patience with QSL cards and was fortunate to have a number of visitors—Graham Hunter, ZCR, Bill ZAAJ and two students from the Technical High Radio Club, Neil Kilgour and Frank Cottrell. While thinking about NCR, I was delighted to receive recently a letter all the way from the U.S. from Mac ZEDM, who, as I recall, as he said he enjoyed reading "A.R." Ron SADA has been visiting Ohio and was staying with WALUZ when the letter was written. According to Roy, the local boys were having quite a field day with the VK stations and some calls mentioned were 2AAT, SAVA, SADK and SAC. The only question which I have to ask is, when are Tony and Graham being sent across the pond by the Canadian students? I am sure that I learned at the Federal Convention.

Have you listened on 160 metres lately? The signals are coming good now that the winter is here and some of the VK3 boys are having a good deal of success with DX. How about some of the present DXers? With this excellent cold weather, Stan HYL had a very good signal, Bill Z2K is on quite often and Jan SHO now has the modulator complete and is testing the transmitter. Of course, ZYL is also still on since on Monday night and should be even more so now that the half wave folded dipole is in operation. Even Bill Z2L has the equipment—an AT3—but when he turns it on the street lights go dim, so I think he has a hidden trap in the back garden is really a hidden trap antenna—but I'm sure you knew that already.

Two members of the newly formed Y.M.C.A. Radio Club in Maitland, Harry Sinclair and Dick Brown, visited the Westlakes Club on the Governor-General's birthday and things look like going along as far as YMC is concerned. If any of you Maitland chaps like giving them a hand, I'm sure they'll appreciate it. A visit has also been promised by Chris ZPZ to his merry men from ZAXC. And the Westlakes Club is looking forward to meeting the representatives of that northern city. Just now there is feverish activity in preparation for the West Australian Branch meeting which will be held on Sunday, 13th June, at the club. There will be transmitter hunts and the usual competitions but most of the hunts—and it is hoped there may be eight all told—will be for amateurs. A showbag containing portable transmitters, DX receivers for 40-metre hunting. If your choice is for two metres then the excellent "sniffer" designed by the V.H.F. group is a must. All the details are available from the editor or you will find the circuit in the April Newsletter. Even if you have no equipment, come along and we'll lend you some since it is quite likely to be cold, and food will be available from the canteen and there will be tea and coffee as well as Fanta and the like.

The June meeting on the 4th in Room 6, Clegg Building, at the Tighes Hill Tech, will be a "standing room only" affair I am sure because Ken JETON ZDK will be there to talk about the Amateur Band and the new 80-metre transceiver. You should not miss this meeting so drag yourselves away from the cosy TV set and come along. We'll even arrange for a larger room if it is necessary.

I must give you a riddle to conclude this month's notes. The question is, who is the "baby doll" on two metres? I was told that Alya ZEDM had a very convincing baby but I'm sure that it has been multiplied many times by now. Have you guessed yet? I'll let you into the secret at the meeting, or the field day, and the subject in question will be there, too. —JAKX

VICTORIA

After a long lèpre it is hoped to find time each month to compile a few notes to cover VK3 Council and general meetings for the benefit of those who may miss hearing the weekly broadcasts.

May 31st was a full house for the annual general meeting of the Division. The previous month gave the members a preview for the past 12 months. It will, as usual, be printed and circulated to all members, so it will not be covered here. The treasurer's report shows our finances to be in a healthy position and apart from a couple of very minor queries everybody appears satisfied with the position.

Only 10 nominations were received for Council and after some confusion and good nature bantam they were declared elected. The 10 include

of the members in the following order: STC, ZAFJ, ZACS, ZEER, ZEZO, ZEIQ and ZEZF plus our two new members, JARV and ZARV.

As John ZOR is unable to continue as president, the meeting made a recommendation to Michael, our Federal Councillor, to present a petition to the Minister of Posts and Telegraphs to upset certain publicity offices who boasts of how his divisional meetings fill a public phone booth every month.

After closing the annual meeting we moved to the general meeting, which gave us the opportunity of hearing 22 stations from all over a most satisfying state of affairs. Michael, our Federal Councillor, gave a short (?) report on the Easter Convention. It is expected that F.E. will shortly have a report ready for "JARV".

To round off the evening, Ken ZTL spoke on his recent DX-pedition to Norfolk Island, illustrating his talk with some very fine photographs.

The last meeting of the old council was held on 26th April, with Pierre ZAFQ as a visitor. Among the many matters discussed were Wav broadband on s.s.b. the Kinnear Trophy, the use of the room for E. meetings, the Federation's proposed provision of equipment for A.O.C.P. classes, the library and problems confronting the Publications Committee.

It was decided that initially a.s.b. will be used on 80 metres although this may prove a problem to some S.W.L. members who rely on domestic dials to receive.

The Kinnear Trophy will go to the Eastern Zone for their outstanding efforts during the recent emergency. The trophy is at present being reconditioned, but will be presented in the near future.

Council agreed that F.E. should use the room behind the post office for storage of their records. It is felt that a teaching organization will enable them to work more efficiently especially if we can give them some secretarial assistance.

Now that other teaching organizations have discontinued their A.O.C.P. classes we are getting full enrolments in our own teaching class. The class instructor is preparing a list of suggested equipment to be acquired for these classes, the list to be considered at the next council meeting.

Certain magazines are in heavy demand and as the Post Office price of copies is now to be purchased. It would help if those taking magazines and books from the library would return them in the shortest possible time.

MOORABBIN AND DISTRICT RADIO CLUB

This month I cannot write that this column will contain very little news of the month as I have been assisted in my task with the dobbled in services of Ken ZNQ. The Club's usual monthly meetings were well attended. The interclub meetings, the Club's general meetings are held the third Friday in each month at the clubhouse, found at the rear of 17 College Grove, Black Rock. On alternate Friday nights a practical evening is held. The practical evening during May con-

sisted of a White Elephant Night. This was very successful both from the members' point of view and of course the treasurer's. A wide variety of things passed hands and junction boxes were the first to go, procure cheapies by the dozen. Old H.E. sets, radio parts, were purchased and given away. It is hoped that these budding ham's will put the parts to good use, and who knows, become the basis of a good commercial concern.

80 m.c. transmitter built in was held in May. Lindsay ZNS was in charge of the party to plant the gear. And what a cunning-type power was chosen. The antenna consisted of a vertical mounted on a short mast approximately 80 feet in height. The tower was in turn attached to some power lines which in turn worked as an excellent radiator. Much to the delight of the occupier of a certain tall light alloy adjacent a drive-in, the transmitter was finally hunted down by Colin XV and Peter XK. Last but not least were Ken ACS, Joan (Mrs. ACS) and Harold ARQ. Of course, Joan always accompanies Ken on the hunting for the best site. The June social evening will be held at the QTH of Harold ARQ, on Saturday, 30th June. At recent socials it has been noticed that a few new faces have been appearing. All members or visitors are welcome and a good time is always assured. Now on to the monthly guff—my XYL, Ruth, a keen listener (you have to be in our household) tells me that ARQ, ZNS and I are to go on a new antenna to replace the monstrosity we had. Stan ZE is frequently heard on 8 m.c. from Upper Beaconsfield. Stan ZE is knocking them back by the dozen on sideband and is seen each meeting holding a full deck of cards. Don ZQZ is on 3 metres using a.s.b. which spares tell me that he is at present gaining the superior knowledge of c.w. ready to take the position. Another member of the a.s.b. club is Alan LC. Who is Alan LC? The two-earner crew are wondering when we can expect to hear your melodious voice on this band again. Peter ZPC is in the midst of constructing a fine final for the 8 m.c. rig. He has recently come back from a tour recently and entertained at the home of Ken ACS. Merv now sports an f.m. rig and it is suggested that anyone with similar gear, switch on near Bairnsdale and you may be rewarded with a call. The ZNS crew has been heard around the city on recent visits. Kevin ARD was noted for his fine opening remarks on Mother's Day at the commencement of the 21st weekly broadcast, and to top it off, it was reported that he was requested by another feminine note, was introduced into the haven of men, a YL, SWL. Elizabeth was invited to read the notes for this section.

We must congratulate Kevin on his recent appointment as a member of the executive of the latter, Ken ACS has been appointed Secretary of the Victorian Division of the W.I.A. Harold ARQ has been appointed to the Federal Council of the W.I.A. There is no truth in the rumour that the Moorabbin Club is infiltrating and about to take over the W.I.A. Harold ARQ, in between times, is working on his 80 m.c. rig and it is believed that the exciter is producing duff type. Lindsay ZNS can vouch that this is true. Bob ZRD has not been heard on 8 m.c. He has, however, been heard consistently on 3 m.c. as a radio hams been on mornings of approximately 0615. I should know as I hear him. One morning recently after Vai OT accused him of being late, he informed the Net that his boss was a kind gentleman, and in fact a day prior to the morning in question, Bob's car broke down. The boss picked him up, at his QTH at some time considerably after the time when they were both supposed to be at work. Looks like someone will have to check up on the boss. Bob has been pretty busy down at the Brighton Scout Hall keeping the Cubs, etc. in order. Off the record, I believe that Harold ARQ is going to sit his A.O.C.P. exam. White Elephant night may bring with it a thing of the past when the new one is bugged. He auctioned three keys at the last White Elephant night, maybe one came from the QTH of Ken ZNQ. An eyeball continued and was involved in the hunting of ZOZ and his coffee pot for the party was well broken up at 0230 hours. Jack must be making up for lost time on the air—hl. I missed out on this one earlier on in these notes. Ken ARQ was recently elected to the chair of President of the Victorian Division of the W.I.A. Congratulations men, now this should

one of his dray-load of receivers, and when delivery was taken found that the second supply for his receiver was also missing. So he had to operate like the rest of us peasants with no linear, or at least until he makes up an alternate supply. What is Phil using for a hearing aid at present? None other than a 1942 job that was dug out of the box, and having a b.f.a. but no control for it. I found that his hot breath was enough to vary its frequency across the pass band! Mr. Larson E. Rapp please note.

Heard Bill SKB the other day when he included the antenna as "a horizontal-vertical piece of wire so high." More details of this would be appreciated for it could even be used as a Funny World subject. Or you know what Funny World is? Anyway Kingston has a worthy member in Bill who usually lives up to what he enters. —Comps SKF (Pro. S.P.B.).

TASMANIA

Our May general meeting was very well attended with about 40 members and several visitors present. Ted TEJ gave us a rundown on the Easter Federal Convention which by all accounts was very well organised. Our lecturer was Mr. Max Burn, of D.C.A., who spoke on "Radio Navigation". Also and followed with two excellent films on navigational aids. The subject was very well received by all, and as our worthy president, Tom, said in his "thank you speech" "One of the best meetings we have had". The temporaries who flew vast unknown areas by the seat of their pants and the grace of God. Watch out, Max, you may be trapped for another go in the not too distant future.

As last year you read last month (that is if you read these notes), and so are the offices they hold. Their jobs were sorted out at the April council meeting, and I am happy to say that everything is in order. Tom TAL was issued with an ultimatum—"Get an aerial up or there'll be a no confidence vote"—I think he is going to co-operate—we frightened him!

VK1ZN is getting under way in VK7 in a big way now, there are about 18 stations

mobile on the 6-metre net in the south of the island, mainly in the Hobart area, and the Northern and North-western Zones are getting into the act. I expect that we will soon have their 6-metre mobile rigs in operation.

H.Q. Zone has an ex-taxi co. a.c. base station which should be installed in the clubrooms before long, once the conversion is

Now for the wing session, short and to the

point this time. Not all the subs. are in yet.

If you have paid yours then thank you for your co-operation, if your dues are still outstanding then pay them now, don't you think

it is high time you did the right thing?

Associate member Mike Hooper (soon to have his call we hope) has "volunteered" after some urging from "Rasputin" ZE2 to act as editor of the wing session. I think that Mike, who works shift work, should be very capable of carrying out this job, and our thanks to you, Mike, for allowing yourself to be talked into this position. We have one High School in Tasmania in the Headquarters Zone, where the science master and some 20 pupils are very keen indeed, and I believe Launceston High School in the N.W. Zone also will be another station.

So consider joining VK7 Division as to the VK5 boys for winning the 1964 R.D. Contest. I know it is late but better late than never. It will soon be R.D. time again, so let us make an all-out effort in Tasmania this year and see if we can take it next time.

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Our clubroom fund has been revived again now that the I.T.U. commitments have been met, and it would be pleasant to see at the May meeting three members (not councillors) offer themselves as a committee. If anybody has any fund-raising ideas let someone know about them. We are about half way to our four-figure targets, so our own building is s-l-o-w-l-y becoming less than just a dream. —VK7ZAB.

NORTH-WEST ZONE

Once again another good roll-up of 17 members in the May meeting, and the members agreed that it was a very interesting evening.

George TXL was the lecturer, and he gave us some good practical circuits of transistors, converters and power supplies. Not much, but George has a way of making each and they both worked fine buildings. George. There should be a lot more members about from now on.

Had a letter from our old friend Basil, 2SK, in which he enclosed his latest QSL card in colour, which is supplied gratis by the Australian Provincial Government, Tasmanian, please note. Basil gets plenty of contacts mainly because of his accent, and won many awards on my behalf.

David TMS can be heard quite often with his new s.s.b. transceiver. Ken TAI has really taken to the air, this time in a plane. Believe he has been flying solo for quite a while. Both TAI and ZAB has been confirmed to be up and about by the time he reads this.

Nice to see this zone well represented in the R.D. Contest results. I reckon there will be some more after this year.

John TJP has settled in at his new home at Gowrie Park and is getting good results with a long wire antenna. Max TXM is still very active on 30 metres and works ZL regularly.

All the best of DX. TKH.

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SUNSPOTS

For those interested, Zurich final analysis of sunspot numbers for 1964 indicated a yearly mean figure of 10.2.

During 1964, sunspots of both old and new cycle occurred in the Northern Hemisphere. According to the Southern Hemisphere it is concerned the new cycle is considered to have started until February, 1965.

The mean number for January, 1965 (Northern Hemisphere) was 18.5 and predictions for the following month for both hemispheres indicated a very slow upward trend to the figure of 20 by July.

For comparison purposes the relative number is in excess of 200.

—Eric Trebillock (L3042).

HAMADS

Minimum 5/-, for thirty words.

Extra words, 2d. each.

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FOR SALE: Complete Station of VK2BJ, now overseas. "Collins" 75S1, 32S1, S16F2 Power Supply and Speaker, "Astatic" 10D Mic. with p.t.t. stand, "Vibroplex" auto. key, "Heath" S.w.r. Bridge and "Gonset" Tri-band Beam. All had little use. £600 the lot. Contact VK2HX. Phone 80-4263.

SWAN 120 Transceiver, s.s.b. complete with home-brew a.c. power supply. Modified to operate on 80, 40 and 20 metres. Now in current use. £150. Apply VK3ARP, 7 Kyora Parade, North Balwyn, Vic. (Ph. 85-1184).

WANTED: Someone to supply or build compact a.c. bench power supply for MR10 2-metre Car Phone. Circuit supplied. Ring 28-2326 (evenings), Melbourne.

WANTED: 2-metre A.M. Transmitter and Receiver, commercial type preferred. Converter suitable for Lafayette may be considered. Tony Swinton (VK3ZGA), 760 Waverley Rd., Glen Waverley, Vic.

COLLINS 75S1 and 32S1 for sale. complete s.s.b. station with 240v. power supply. As new condition. £650. VK2BRW, W. Beveridge, 18 Murdoch St., Turramurra, N.S.W. (44-7701).

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FOR SALE: Galaxy III Transceiver and Power Supply (a.c.), used 5 months only. Price nearest £200. Save £65 on a new one. VK5GX, G. Wilde, 27 Pepper Street, Magill, S.A.



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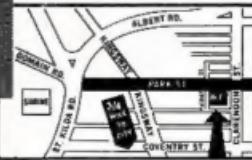
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